

IN THE CLAIMS

This listing of claims replaces all prior listings and versions of the claims in the present application.

Listing of Claims:

Claim 1 (Currently Amended): A synthetic gas manufacturing plant comprising:

- a reformer having a reaction tube, a combustion radiation unit arranged around the reaction tube to heat the reaction tube, and a convection unit communicating with the combustion radiation unit;
- a source gas supply passageway to supply a natural gas to the reformer;
- a steam supply passageway to supply steam to the source gas supply passageway;
- a carbon dioxide recovery apparatus to which a total amount of combustion exhaust gas flowing through the convection unit of the reformer is supplied, and which recovers carbon dioxide from the combustion exhaust gas;
- a compressor to compress the recovered carbon dioxide; and
- a return passageway to supply part or ~~the whole~~ all of the compressed carbon dioxide from the compressor to the source gas supply passageway,

wherein the compressor is driven by a steam turbine powered by steam which is generated by a first heat exchanger able to generate steam by exchanging heat between a synthetic gas synthesized by the reformer and water and/or by second heat exchanger able to generate steam by exchanging heat with water in the convection unit of the reformer.

Claim 2 (Original): A plant according to claim 1, wherein passageway area varying means is placed in the convection unit, and supplies the total amount of combustion exhaust gas flowing in the convection unit to the carbon dioxide recovery apparatus.

Claims 3-5 (Canceled).

Claim 6 (Currently Amended): A synthetic gas manufacturing method comprising steps of:

providing a synthetic gas manufacturing plant which comprises

(a) a reformer having a reaction tube, a combustion radiation unit arranged around the reaction tube to heat the reaction tube, and a convection unit communicating with the combustion radiation unit,

(b) a source gas supply passageway to supply a natural gas to the reformer,

(c) a steam supply passageway to supply steam to the source gas supply passageway,

(d) a carbon dioxide recovery apparatus to which a total amount of combustion exhaust gas flowing through the convection unit of the reformer is supplied, and which recovers carbon dioxide from the combustion exhaust gas,

(e) a compressor to compress the recovered carbon dioxide, and

(f) a return passageway to supply part or ~~the whole~~ all of the compressed carbon dioxide from the compressor to the source gas supply passageway;

recovering, by the carbon dioxide recovery apparatus, carbon dioxide in the total amount of combustion exhaust gas which is exhausted from the combustion radiation unit of the reformer, and flows in the convection unit;

compressing the carbon dioxide recovered by the carbon dioxide recovery apparatus by the compressor; and

supplying part or ~~the whole~~ all of the compressed carbon dioxide to the source gas supply passageway through the return passageway, and supplying steam to the source gas supply passageway through the steam supply passageway, thereby supplying a gas mixture of

the natural gas, compressed carbon dioxide, and steam, as a source gas, to the reaction tube externally heated by the combustion radiation unit of the reformer,

wherein the method further comprises providing a steam turbine powered by steam for driving the compressor which is generated by exchanging heat between a synthetic gas synthesized by the reformer and water and/or by exchanging heat with water in the convection unit of the reformer.

Claim 7 (Original): A method according to claim 6, wherein the total amount of combustion exhaust gas flowing in the convection unit is supplied to the carbon dioxide recovery apparatus by passageway area varying means placed in the convection unit.

Claims 8-9 (Canceled).

Claim 10 (Original): A method according to claim 6, wherein a portion of the compressed carbon dioxide not used as a source gas is supplied into the ground and fixed therein.

Claim 11 (Original): A method according to claim 6, wherein the manufactured synthetic gas is used in synthesis of methanol, synthesis of dimethylether, or synthesis of gasoline, kerosene, and light oil in a Fischer-Tropsch reaction system.